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| 7590 03/07/2007 | | | | |
| John S. Beulick Armstrong Teasdale LLP Suite 2600 One Metropolitan Square St. Louis, MO 63102 | | EXAMINER BITAR, NANCY | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/722,974

Applicant(s)

KARAU ET AL.

Examiner

Nancy Bitar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) 1-21 and 26-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-25 and 40-47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 November 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>10/4/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-21, and 26-39, drawn to "acquiring an image on an imaging system", classified in class 382, subclass 128.
 - II. Claims 22-25, and 40-47, drawn to "analysis of dual resolution image data", classified in class 382, subclass 299.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination II has separate utility such as performing a volumetric analysis in of at least one feature of interest in the low-resolution data and substituting high resolution image data for analyzed low resolution data. See MPEP § 806.05(d).

The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to

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provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

3. During a telephone conversation with Mr. William J. Zychlewics on 02/15/2007 a provisional election was made with traverse to prosecute the invention of "analysis of dual resolution image data ", claims 22-25 and 40-47. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-21 and 26-39 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Objections

4. Claim 22 is objected to because of the following informalities: language informalities were "a" must be before seamless display " A method for a seamless display". Appropriate correction is required.

5. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. Figures 1 and 2 were previously presented with the same labeling in US patent 7,013,034. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the

applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 U.S.C. § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 22-25 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The recitation at lines 8-9 of claim 22 of "analysis result of the high resolution" is unclear, because no analysis of the high resolution took place in the sequence. Because no "analysis of high resolution" are defined by or recited in the preceding claim language, it is unclear what feature or element is being further defined by this claim language, so that the claim fails to clearly point out and distinctly claim applicant's invention. Moreover, claim 25 of "obtaining high-resolution data representative of an area in an object for which high-resolution data is absent" is unclear, because how one can obtain the high-resolution data of an object with the absence of high resolution. It is unclear what feature or element this claim language, is further defining, so that the claim fails to clearly point out and distinctly claim applicant's invention. Claims 23-25 are variously dependent from claim 22 and are thus similarly indefinite.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See *Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

Claims 40-47 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 40 defines a computer program embodying functional descriptive material. However, the claim does not define a computer-readable medium or memory and is thus non-statutory for that reason (i.e.,

"When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). That is, the scope of the presently claimed a computer program can range from paper on which the program is written, to a program simply contemplated and memorized by a person. The examiner suggests amending the claim to embody the program on "computer-readable medium" or equivalent in order to make the claim statutory. Examiner would like to advise applicant to change "machine readable medium" to "computer readable medium" in order to make it statutory. Any amendment to the claim should be commensurate with its corresponding disclosure.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

9. Claims 22-25 and 41-47 are rejected under 35 U.S.C. § 102(e) as being anticipated by Hsieh et al. (US 6,687,329).

As to claim 22, as best understood, Hsieh et al teaches a method for seamless a display and analysis of dual resolution image data, said method comprising:

reviewing image data at low resolution (initial data acquisition, 108, figure 5);

performing a volumetric analysis of at least one feature of interest in the low resolution data (preliminary target, 114, figure 5); substituting high-resolution image data for analyzed low resolution data without operator intervention (additional data acquisition, 122, figure 5, note that entirely different acquired data may be desired based upon the initial CAD evaluation, such as data acquired via an entirely different modality system, column 8, lines 1-5); and displaying a volume rendering (the modality may be coupled with particular settings, also typically dictated by the physics of the system, to provide higher or lower contrast images, volume rendering, sensitivity or insensitivity to specific tissues, column 8, lines 16-30) of the low resolution data and analysis results of the high-resolution data in a single display (presentation to radiologists, 124, figure 5). Note that Hsieh et al clearly teaches that the imaging system may also be of different modalities were a PET system is considered a low resolution whereas "the subsequent acquisition may include acquisition of data from other regions of the patient's body, at different orientations with respect to tissues of interest, at different resolution levels, and so forth. Moreover, entirely different acquired data may be desired based upon the initial CAD evaluation, such as data acquired via an entirely different modality system, column 7, lines 60-67).

As to claim 23, Hsieh et al. teaches a method in accordance with claim 22 wherein an area in an object in which the high-resolution data represents is selected based on results of a CAD algorithm (The first series of images is then processed in accordance with a CAD algorithm. A second series of images is then acquired based upon the results of the CAD algorithm, column 2, lines 50-56).

As to claim 24, Hsieh et al. teaches a method in accordance with claim 22 wherein the high resolution data is present for only the features of interest identified by a CAD algorithm (The particular CAD algorithm is commonly selected based upon the type of feature to be identified, and upon the imaging modality used to create the image data. The CAD technique may employ segmentation algorithms, which identify the features of interest by reference to known or anticipated image characteristics, such as edges, identifiable structures, boundaries, changes or transitions in colors or intensities, changes or transitions in spectrographic information, and so forth. Current CAD algorithms generally offer the potential for identifying these features only. Subsequent processing and data acquisition is, then, entirely at the discretion and based upon the expertise of the practitioner, column 6, lines 2-14).

As to claim 25, as best understood, Hsieh teaches a method in accordance with claim 22 further comprising obtaining high-resolution data representative of an area in an object for which high-resolution data is absent (column 6, lines 41-57).

Claims 41-43 differ from claims 22-25 only in that claims 22-25 are a method claim whereas, claims 41-43 are computer claim. Thus, claims 41-43 are analyzed as previously discussed with respect to claims 22-25 above.

Claims 44-47 differ from claims 22-25 only in that claims 22-25 are a method claim whereas, claims 44-47 are an apparatus claim. Thus, claims 44-47 are analyzed as previously discussed with respect to claims 22-25 above.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Boing et al (US 2006/0245536) is cited to teach a cardio CT appliance, where a first low-resolution reconstruction of cardio recordings in a multiplicity of cycle phases of the cardiac cycle and subsequent volume rendering of these cardio recordings for 3D representation and examination of the clarity of motion of the representation in the individual cycle phases are performed. This representation is used to select one or two cycle phases with a relatively reduced or even minimal lack of clarity of motion. High-resolution representations of the heart are reconstructed for these selected one or two cycle phases, with the computation and control unit transmitting only the high-resolution representations of the selected cycle phases with a relatively reduced lack of clarity of motion to the at least one workstation as still images, and the workstation being used to perform the evaluation.

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Chihoub et al (US 2006/0256111) is cited to teach volume rendering computing sub-system includes look-up-tables (LUT) for classifying image intensity values, and further comprising using said fusion factor to use an 8-bit LUT with said low resolution dataset and to use a 12-bit LUT with said high resolution dataset.

"Volume Pro 1000 Principles of Operation"; TeraRecon, Inc, December 2001 is cited to teach aspects of Volume rendering with multi-resolution.

Inquires

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nancy Bitar whose telephone number is 571-270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on 571-272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nancy Bitar

02/15/2007



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